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AMENDMENT **AP20 Rec'd PCT/PTO 01 JUN 2006**

(Amendment under the provision of Article 11 of Japanese Patent Law)

To: Director-General of Patent Office

1. Indication of International Application:

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3. Date of Amendment Order: 12. 04. 05

4. Subject of Amendment: description and claims

5. Contents of Amendment

(1) The description in page 2 line 25 to page 3 line 8 (page 4 line 20 to page 5 line 15 in the English version) is amended to "To achieve the above object, according to a first feature of the present invention, --- a region corresponding to the air layer." as shown in the attached sheets.

(2) "According to a third feature of the present invention, in addition to the first or second feature," in page 3 line 9 (page 5 lines 16 and 17 in the English version) of the description is amended to "According to a second feature of the present invention, in addition to the first feature," as shown in the attached sheets.

(3) "According to a fourth feature of the present invention, in addition to any of the first to third features," in page 3 line 13 (page 5 lines 23 and 24 in the English version) of the description is amended to "According to a third feature of the present invention, in addition to the first or second feature," as shown in the attached sheets.

(4) "According to a fifth feature of the present invention, in addition to any of the first to fourth features," in page 3 line 19 (page 6 lines 7 and 8 in the English version) of the description is amended to "According to a fourth feature of the present invention, in addition to any of the first to third features," as shown in the attached sheets.

(5) "As described above, with each of the first to fifth features of the present invention," in page 3 line 23 (page 6 lines 11 and

12 in the English version) of the description is amended to "As described above, with each of the first to fourth features of the present invention," as shown in the attached sheets.

(6) "Particularly, with the second feature of the present invention," in page 4 line 17 (page 8 lines 7 and 8 in the English version) of the description is amended to "Additionally," as shown in the attached sheets.

(7) "Further, --- to the outside." is inserted between page 4 line 22 and line 23 (page 8 line 18 and line 19 in the English version) of the description, as shown in the attached sheets.

(8) "Particularly, with the third feature of the present invention," in page 4 line 23 (page 8 lines 19 and 20 in the English version) of the description is amended to "Particularly, with the second feature of the present invention," as shown in the attached sheets.

(9) "Particularly, with the fourth feature of the present invention," in page 4 line 27 (page 9 lines 2 and 3 in the English version) of the description is amended to "Particularly, with the third feature of the present invention," as shown in the attached sheets.

(10) "Particularly, with the fifth feature of the present invention," in page 5 line 6 (page 9 lines 19 and 20 in the English version) of the description is amended to "Particularly, with the fourth feature of the present invention," as shown in the attached sheets.

(11) "bold rines L" in page 7 line 1 (page 13 line 4 in the English version) of the description is amended to "bold lines L" as shown in the attached sheets.

(12) "whether or not the humidity in the packaging bag DP does not exceed" in page 9 line 11 (page 18 lines 8 and 9 in the English version) is amended to "whether or not the humidity in the packaging bag DP exceeds" as shown in the attached sheets.

(13) Claims 1, 3, 4 and 5 are amended and claim 2 is deleted as shown in the attached sheets.

6. List of the attached documents:

(1) Pages 2, 3, 4, 5, 7 and 9 of the description (pages 4, 5, 6, 6/1, 8, 9, 9/1, 13 and 18 in the English version)

(2) Pages 12 and 13 of the Claims (pages 24 and 25 in the English version)

an outer surface or a cut face of such paper. When the dust adheres to an electronic part, there is a possibility that the performance of the electronic part may be influenced. Therefore, it is desirable to prevent the dust generated from the base paper sheet from being diffused to the outside.

Further, there is a possibility that when another part or a packaging material in a charged state is brought near to the electronic part, the performance of the electronic part may be influenced and moreover, dust is liable to adhere to the part or the like in the charged state by a static electricity. Therefore, it is desirable that the humidity indicator itself is hard to be charged with electricity as much as possible in view of avoiding the influence of electrostatic charge and the influence of the dust.

The present invention has been accomplished with the above-described circumstances in view, and it is an object of the present invention to solve the above-described conventional problems in a simple structure.

MEANS FOR SOLUTION OF THE PROBLEMS

To achieve the above object, according to a first feature of the present invention, there is provided a humidity indicator, comprising at least one humidity-determining face which is provided on a surface of a humidity-determining plate comprising cobalt chloride held in a base paper sheet, so that the cobalt chloride is exposed to the humidity-determining face, whereby humidity is determined by the discoloration of the cobalt

chloride on the humidity-determining face, characterized in that the humidity indicator further includes a first film covering the surface of the humidity-determining plate and forming the surface of the humidity indicator, and a second
5 film covering the back of the humidity-determining plate and forming the back of the humidity indicator; a flat air layer is formed at least between the first film and the surface of the humidity-determining plate, so that the entire surface of the humidity-determining face faces to the air layer; a plurality
10 of small holes are formed at distances from one another in the first film to permit the direct communication of the air layer with the atmosphere; the first and second films are formed to protrude from an outer peripheral edge of the humidity-determining plate and bonded at outer peripheral edge
15 portions thereof directly to each other; and the first and second films are bonded in a compression manner to a portion of the humidity-determining plate surrounding a region corresponding to the air layer.

According to a second feature of the present invention,
20 in addition to the first feature, a plurality of the humidity-determining faces are arranged at distances on the surface of the humidity-determining plate in correspondence to a plurality of different humidity levels, respectively, and the air layer is formed commonly to the plurality of
25 humidity-determining faces.

According to a third feature of the present invention,

in addition to the first or second feature, the base paper sheet is a filter paper having a hygroscopicity; a flat second air layer is formed between the second film and the back of the humidity-determining plate, so that at least a region or regions of the back corresponding to the humidity-determining face or faces face to the second air layer; and a plurality of small holes are formed at distances from one another in the second film to permit the direct communication of the second air layer with the atmosphere.

According to a fourth feature of the present invention, in addition to any of the first to third features, each of the films has been subjected to an antistatic treatment.

EFFECT OF THE INVENTION

As described above, with each of the first to fourth features of the present invention, the surface and back of the humidity-determining plate are covered with the first and second films. Therefore, even if an operator directly picks the humidity indicator with his or her hand, the cobalt chloride on the humidity-determining face can be prevented effectively from adhering to the hand and thus, entering into the operator's body, and the operator can handle the humidity indicator without anxiety. In addition, the humidity indicator is of such a structure that even if fine dust (such as paper scraps and fiber) is generated from the base paper sheet of the humidity indicator, it is blocked off each of the films and hard to be diffused to the outside. Therefore, even if the humidity

indicator is sealedly accommodated along with electronic parts and the like adversely affected by dust, the influence of dust to the electric parts can be prevented effectively.

operation is hard to conduct. However, according to the present invention, the air layer is interposed between the small holes and the humidity-determining faces and hence, not only the portions corresponding to the small holes but also the entire
5 surfaces of the humidity-determining faces can be discolored uniformly, and thus, such problem can be eliminated.

Additionally, the first and second films are formed to protrude from the outer peripheral edge of the humidity-determining plate, and bonded at their outer peripheral
10 edges directly to each other. Therefore, the outer peripheral edge of the base paper sheet can be covered completely with the first and second films and hence, it is possible to reliably prevent the generation of dust from a cut face of the outer periphery of the base paper sheet. In addition, because the
15 films are bonded directly to each other, it is possible to carry out the bonding operation relatively easily and reliably, leading to the simplification of the bonding step.

Further, since the first and second films are bonded in a compression manner to a portion of the humidity-determining
20 plate surrounding a region corresponding to the air layer, it is possible to minimize the diffusion of the dust generated from the base paper sheet to the outside.

Particularly, with the second feature of the present invention, a plurality of the humidity-determining faces are
25 arranged at the distances on the surface of the humidity-determining plate in correspondence to a plurality

of different humidity levels, and the air layer is formed commonly to the plurality of humidity-determining faces. Therefore, the step for forming the air layer is simplified, as compared with a case where air layers are formed for every humidity-determining faces.

Particularly, with the third feature of the present invention, the base paper sheet of the humidity-determining plate is the filter paper having the hygroscopicity; the flat second air layer is formed between the second film and the back of the humidity-determining plate, so that at least the region or regions of the back corresponding to the humidity-determining face or faces face to the second air layer; and the plurality of small holes are formed at distances from one another in the second film to permit the direct communication of the second air layer with the atmosphere. Therefore, when the humidity indicator has been taken in the atmosphere out of a sealed storage container or the like, the humidity in the atmosphere is transmitted from the back side of the base paper sheet through the inside of the base paper sheet even to the surface-side air layer. Accordingly, it is possible to more enhance the sensitivity of portions of the humidity-determining faces on the side of the surface to the change in humidity.

Particularly, with the fourth feature of the present invention, the films have been subjected to the antistatic treatment and hence, the humidity-determining plate itself is hard to charge with electricity and moreover, it is hard for

dust to adhere to the films by static electricity. Thus, even if the humidity indicator is sealedly accommodated along with electronic parts, it is possible to avoid the influence of charging to the electronic parts and the influence of dust as

permeated into and held in the base paper sheet B. Thus, portions of the surface of the base paper sheet B corresponding to positions of dropping of the cobalt chloride solutions are the humidity-determining faces M1 to M4. Black bold lines L have
5 been printed in a proper shape (a quadrilateral shape in the illustrated embodiment) on the surface of the base paper sheet B for clearly indicating borders between the humidity-determining faces M1 to M4, while respectably hiding the permeation of the solutions into peripheral edges of the
10 portions, onto which the solutions have been dropped. Further, indications (5 %, 10 %, 20 % and 30 %) of limit humidity values capable of being checked by the humidity-determining faces M1 to M4 have been printed on or in the vicinity of the humidity-determining faces M1 to M4. The structure of the
15 humidity-determining plate P described above is conventionally well-known.

On the other hand, the cover member C is comprised of a first film F1 covering the surface of the humidity-determining plate P, and a second film F2 covering the back of the
20 humidity-determining plate P. The first and second films F1 and F2 are formed to protrude from an outer peripheral edge of the humidity-determining plate P and bonded at m at their peripheral edges F1a and F2a directly to each other, so that the entire resulting film assembly is formed into a flat
25 quadrilateral bag-shape.

Each of the films F1 and F2 is formed of a transparent

electronic parts E and a drying agent D in a transparent air-tight packaging bag DP, as illustrated in Fig.4 in the transportation of the electronic parts such as circuit boards adversely affected by moisture, and the electronic parts E are transported as
5 remaining contained in the packaging bag DP. A container provided with a lid for sealing may be used in place of such packaging bag.

During the transportation, whether or not the humidity in the packaging bag DP exceeds a defined limit can be visually
10 determined by the colors of the humidity-determining faces M1 to M4 of the humidity indicator I (based on whether or not the humidity-determining faces M1 to M4 have been discolored). Therefore, it is possible to easily check whether or not the inside of the packaging bag DP with the drying agent D contained
15 therein is kept in a proper humidity state (a dried state) during the transportation.

When the packaging bag DP is opened to remove the electronic parts E, the operator picks the humidity indicator I with his or her hand, takes it out of the packaging bag and checks the
20 colors of the humidity-determining faces M1 to M4. The surface and back of the humidity-determining plate P are covered with the first and second films F1 and F2 in the humidity indicator I of the present embodiment, and hence, even if the operator has picked the humidity indicator I directly with his or her
25 hand, it is possible to effectively prevent the cobalt chloride Co on the humidity-determining faces M1 to M4 from adhering

CLAIMS

1.(amended) A humidity indicator, comprising at least one humidity-determining face (M1 to M4) which is provided on a surface of a humidity-determining plate (P) comprising cobalt chloride (Co) held in a base paper sheet (B), so that the cobalt chloride (Co) is exposed to the humidity-determining face, whereby humidity is determined by the discoloration of the cobalt chloride (Co) on the humidity-determining face (M1 to M4), characterized in that

10 said humidity indicator further includes a first film (F1) covering the surface of said humidity-determining plate (P) and forming the surface of said humidity indicator, and a second film (F2) covering the back of said humidity-determining plate (P) and forming the back of said humidity indicator;

15 a flat air layer (Au) is formed at least between the first film (F1) and the surface of the humidity-determining plate (P), so that the entire surface of said humidity-determining face (M1 to M4) faces to said air layer (Au);

20 a plurality of small holes (H) are formed at distances from one another in said first film (F1) to permit the direct communication of said air layer (Au) with the atmosphere;

25 said first and second films (F1, F2) are formed to protrude from an outer peripheral edge of said humidity-determining plate (P) and bonded (m) at outer peripheral edge portions (F1a and F2a) thereof directly to each other; and

 said first and second films (F1, F2) are bonded in a

compression manner to a portion of said humidity-determining plate (P) surrounding a region corresponding to said air layer (Au).

2.(deleted)

5 3.(amended) The humidity indicator according to claim 1, wherein
a plurality of said humidity-determining faces (M1 to M4) are arranged at distances on the surface of said humidity-determining plate (P) in correspondence to a plurality of different humidity levels, respectively; and

10 said air layer (Au) is formed commonly to a plurality of said humidity-determining faces (M1 to M4).

4.(amended) The humidity indicator according to claim 1 or 3, wherein

15 said base paper sheet (B) is a filter paper having a hygroscopicity;

a flat second air layer (Ad) is formed between said second film (F2) and the back of said humidity-determining plate (P), so that at least a region or regions of said back corresponding to said humidity-determining face or faces (M1 to M4) face to
20 the second air layer (Ad); and

a plurality of small holes (H') are formed at distances from one another in said second film (F2) to permit the direct communication of said second air layer (Ad) with the atmosphere.

25 5.(amended) The humidity indicator according to claim 1, 3 or 4, wherein that each of said films (F1, F2) has been subjected to an antistatic treatment.